

REMARKS/ARGUMENTS

The amendment to Claim 16 is supported at specification page 12, lines 15-23, which states (emphasis added):

It has been observed that, in the composition according to the present invention, not only the phosphorous-containing compound but also surprisingly the B<sup>ol</sup> A PSU act as melt stabilisers of the B<sup>ol</sup> PSU (i.e. both contribute to minimise or prevent viscosity rise at high temperature). Furthermore, in a quite unexpected way for the skilled person, said B<sup>ol</sup> A PSU and said phosphorous-containing compound, act in a synergetic way, resulting in a composition having an outstanding melt stability; this synergetic effect is highlighted when the phosphorus-containing compound is present in an amount of above 0.05% by weight, based on the total weight of the composition.

Other amendments to Claim 16 are found as specification page 4, lines 4-6 and page 9, lines 18-20. The amendment to Claim 21 is supported at specification page 4, line 6. Finally, new Claim 39 is supported at specification page 12, lines 21-23. No new matter has been entered.

As both explained and demonstrated in the present specification, Applicant's presently claimed 4,4'-biphenol polysulfone composition comprises a synergistic melt stability enhancing combination of the three components listed in the claims: B<sup>ol</sup> PSU; at least one phosphorus-containing compound selected from the group consisting of organic phosphites and organic phosphonites; and B<sup>ol</sup> A PSU. For example, as shown in Table 1 at specification page 13:

TABLE 1

	CE1	CE2	CE3	E1
<u>Composition Identifier</u>				
(a) B <sup>ol</sup> PSU Radel ® R-5600 NT	100	100	90	90
(b) Phosphorus-containing compound Sandostab ® PEPQ	—	0.10	—	—
(b') Phosphorus-containing compound Irgafos ® 168	—	—	—	0.15
(c) B <sup>ol</sup> A PSU UDEL ® PXM-98084	—	—	10.00	9.85
<u>Melt viscosity</u>				
Melt viscosity at t <sub>0</sub> + 10 min [410° C./50 sec <sup>-1</sup> ] (Pa · s)	283	287	261	225
Melt viscosity stability VR <sub>40</sub> [410° C./50 sec <sup>-1</sup> ] (—)	1.59	1.24	1.30	1.12
<u>Mechanical Properties</u>				
Tensile strength (MPa)	76.3	76.6	76.5	77.0
Tensile modulus (MPa)	2482	2544	2454	2454
Tensile yield elongation (%)	7.9	7.8	7.8	7.6
Tensile elongation at break (%)	103	19	69	83

the addition of a phosphorus-containing compound alone (CE2) to the B<sup>ol</sup> PSU (CE1) reduces the melt viscosity ratio (VR40 at 410°C) from 1.59 to 1.24. The addition of B<sup>ol</sup> A PSU (CE3) alone has substantially the same effect, reducing the melt viscosity ratio from 1.59 to only 1.30. However, compositions according to the invention (e.g., E1) show a synergetic effect in the presence of both the phosphorus-containing compound and the B<sup>ol</sup> A PSU, displaying a melt viscosity ratio as low as 1.12, while at the same time maintaining the outstanding properties of the B<sup>ol</sup> A PSU.

As the Examiner will readily recognize, none of the prior art cited against the present claims discloses or suggests the possibility of synergism. Moreover, and as noted in the MPEP 716.02(a), even in the face of a *prima facie* case of obviousness a result that is greater than expected (i.e., synergy), when unexpectedly found as here, establishes patentability:

**716.02(a) Evidence Must Show Unexpected Results [R-2]**

**I. < GREATER THAN EXPECTED RESULTS ARE EVIDENCE OF NONOBVIOUSNESS**

"A greater than expected result is an evidentiary factor pertinent to the legal conclusion of obviousness ... of the claims at issue." *In re Corkill*, 711 F.2d 1496, 226 USPQ 1005 (Fed. Cir. 1985). In *Corkhill*, the claimed combination showed an additive result when a diminished result would have been expected. This result was persuasive of nonobviousness even though the result was equal to that of one component alone. Evidence of a greater than expected result may also be shown by demonstrating an effect which is greater than the sum of each of the effects taken separately (i.e., demonstrating "synergism"). *Merck & Co. Inc. v. Biocraft Laboratories Inc.*, 874 F.2d 804, 10 USPQ2d 1843 (Fed. Cir.), *cert. denied*, 493 U.S. 975 (1989). However, a greater than additive effect is not necessarily sufficient to overcome a *prima facie* case of obviousness because such an effect can either be expected or unexpected. Applicants must further show that the results were greater than those which would have been expected from the prior art to an unobvious extent, and that the results are of a significant, practical advantage. *Ex parte The NutraSweet Co.*, 19 USPQ2d 1586 (Bd. Pat. App. & Inter. 1991) (Evidence showing greater than additive sweetness resulting from the claimed mixture of saccharin and L-aspartyl-L-phenylalanine was not sufficient to outweigh the evidence of obviousness because the teachings of the prior art lead to a general expectation of greater than additive sweetening effects when using mixtures of synthetic sweeteners.).

Certainly, none of U.S. '466, U.S. '493, GB '133, SU '293 or WO '520 suggests a synergistic result as being expected or possible, even when taken in combination.

With regard to the *prima facie* case herein, in the first instance WO '520 is not available as prior art against the present application. The Examiner will note that the present application lists one inventor who is the same inventor listed on WO '520. Because WO '520 was published less than one year before Applicant's U.S. filing date (i.e., PCT date) of December 17, 2003, WO '520 cannot qualify as prior art under 35 U.S.C. 102(b) and does not qualify as prior art under 35 USC 102(a) or (e) as it is not the publication of "another." U.S. '466, U.S. '493, GB '133 and SU '293, while older, do not disclose or suggest all they have been cited for,<sup>1</sup> or the synergistic results unexpectedly found herein, nor could they

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<sup>1</sup> For example, GB'133 describes thermoplastic aromatic polysulfone compositions comprising 4 different types of recurring units (see page 1, line 8 to page 2) and from 0.01 to 4% by weight of at least one phosphite ester (see page 2, first paragraph). It does not disclose or suggest a composition comprising at least one polysulfone comprising more than 50 mol. % of recurring units formed by reacting 4,4'-biphenol (-O-Ph-Ph-O) with at least one sulfone

since several references are used simply in an attempt to provide individual aspects and components of the presently claimed composition. Even if the several components required in Applicant's present claims were shown to have separately existed in the prior art, which they have not been, and even if their combination was suggested, which it is not, never before have the presently claimed components been used in a combination as claimed in the present invention: i.e., in a synergistic melt stability enhancing combination, nor would the same have been expected from the disclosures in these references. For these reasons Claim 16 and the claims dependent thereon are clearly patentable over the combination of references applied herein.

Similarly, independent Claim 29 herein, and the claims dependent thereon, describe a unique, patentable 4,4'-biphenol polysulfone composition having a melt viscosity ratio of below 1.20 which is neither described nor suggested by the combination of art applied herein. GB '133 and SU '293 have been commented on above. U.S. '466 and U.S. '493 do not in any way, shape or form disclose or enable one of ordinary skill in the art to provide a B<sup>ol</sup> PSU-based composition having a melt viscosity ratio at 410°C and at a shear rate of 50 s<sup>-1</sup> (VR<sub>40</sub>) of below 1.20. Applicant has invented such a composition, as shown herein and discussed in detail above, and the same is patentable over the combination of prior art applied against the claims.

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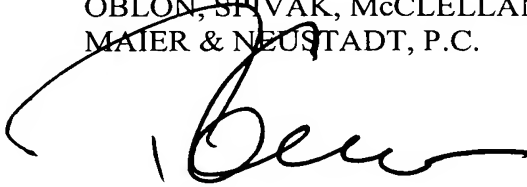
monomer. SU'923 describes compositions comprising Ph-SO<sub>2</sub>-Ph-O- resins and phosphite ester compounds. It does not disclose or suggest the polysulfones of claim 16.

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Accordingly, and in view of the above amendment and remarks, and for all these reasons, Applicant respectfully requests the reconsideration and withdrawal of the outstanding rejections, and the passage of this case to Issue.

Respectfully submitted,

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A handwritten signature in black ink, appearing to read 'R. Treanor', is written over a horizontal line.

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